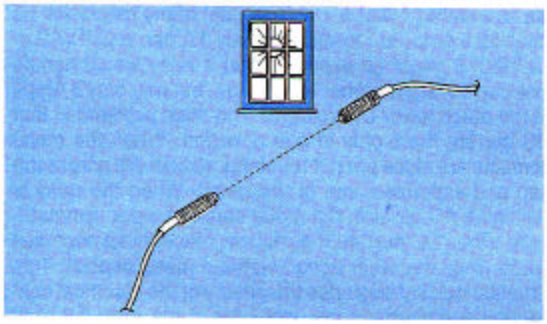
TECHNICAL INFORMATION

Features
- Solid-state — long life
- Electrically quiet
- Isolation

Limitations
- AC only
- Limited current capacity
- Relatively slow

Modulating controls eliminate problems caused by ambient light.



The range of a system can be increased by modulating controls.

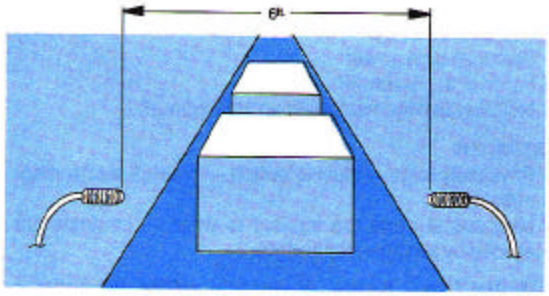


FIG. 11A

Modulating Controls

Modulating controls turn the light source on and off several thousand times per second. The amplifier portion of the control is designed to respond only to signals with that on/off frequency. Even though the photodetector reacts to other signals, these will be rejected by the amplifying circuitry. Modulating controls have longer response times than a similar but non-modulating control. Because the control must recognize the on/off pattern, the response time must be greater than the period of modulation. As noted earlier, only Light Emitting Diodes (LED's) can be used as the light source for modulated systems — the glowing filament of an incandescent lamp takes too long to heat and cool.

Modulating an LED light source produces two major benefits. First, false triggering from ambient light or random reflections is greatly reduced. Second, the range of the system can be greatly increased. Modulating controls can often extend the useful range of a skanner or thrubeam from 2 to 5 times the range possible with a similar continuous operation control. Two factors contribute to the longer range. When problems with ambient light are eliminated, the sensitivity of the amplifier can be increased. Also, since the LED is being driven for only a fraction of the modulation period, drive current can be momentarily very high, producing a high light output.

As an example, consider a Skan-A-Matic LED light source rated at 100mA for continuous operation. The resistor shipped with the light source would normally limit the current flow thru the LED to 100mA during continuous operation. If the LED is modulated so that it is ON half the time, and OFF half the time (50% duty cycle), momentary drive current can be 200mA without damaging the LED. A lower value resistor would still be needed to limit the drive current to 200mA.

Skan-A-Matic modulating controls have a 50% duty cycle and a built-in current-limiting resistor for 100mA LED's. Any reflective skanner or thrubeam pair with a 100mA LED can be connected directly to the light source terminals of the control. LED's with lower current ratings must be wired in series with an additional external resistor; the correct resistor value is given for each sensor or control on its catalog page under the Compatibility heading.